

REMARKS/ARGUMENTS

In the Office Action mailed January 23, 2004, the abstract and the title of the invention were objected to as not being clearly indicative of the elected invention. In addition, claims 1 and 4 were rejected under 35 U.S.C. § 102(b) over U.S. Patent No. 2,938,807 to *Andersen*, and claims 1 and 6 were rejected under § 102(b) over U.S. Patent No. 5,643,514 to *Chwastiak et al.* Also, claims 1–4, 7 and 12 were rejected under 35 U.S.C. § 103(a) over *Andersen* in view of U.S. Patent Pub. No. 2003/0180579 to *Waggoner et al.*, and claims 1–3 and 6–12 were rejected under § 103(a) over *Chwastiak* in view of *Waggoner*. Finally, claim 4 was rejected under § 103(a) over *Chwastiak* in view of *Waggoner*, and further in view of *Andersen*, and claims 4 and 5 were rejected under § 103(a) over *Chwastiak* in view of *Waggoner* and further in view of U.S. Patent No. 5,618,767 to *Benker*.

The abstract and title of the invention are amended to be more clearly indicative of the elected invention. Support for the amendment can be found, among other places, in the specification, page 3, paragraphs [10] and [11]. Claims 13–24 are canceled.

The amendment also adds claims 25–32. Support for claim 25 can be found in the specification on page 5, paragraph [20], and support for claims 26–32 can be found on page 4, paragraphs [14] and [15] as well as original claims 1–12. No new matter is added by the amendment, and claims 1–12 and 25–32 are pending in the application. Reconsideration and withdrawal of the objections and rejections are respectfully requested in light of the amendment and remarks that follow.

A. The Objections to the Abstract and Title of the Invention are Addressed

The abstract was objected to for not reciting the steps of the claimed process, and the title of the invention was objection to for not being clearly indicative of the elected invention. These objections are made moot by the amendment, which incorporates steps of the claimed process in the abstract and clarifies the title of the invention. Accordingly, withdrawal of the objection to the abstract and title is respectfully requested.

B. The Rejection of Claims under § 102 is Addressed

Claims 1 and 4 were rejected under 35 U.S.C. § 102(b) as being anticipated by *Anderson*, and claims 1 and 6 were rejected as being anticipated by *Chwastiak*. These rejections are believed to be moot in light of the amendment.

Claim 1, as amended, has the ceramic slurry including "about 0.01% to about 15 wt% starch" as an organic gelation agent (*e.g.*, a binder). In contrast, neither *Anderson* nor *Chwastiak* mention using a starch as a binder, much less using a starch in the range of about 0.01 wt% to about 15 wt% of the slurry.

Because neither reference describes using starch as a binder in a ceramic slurry, they lack all the elements of claim 1, and the claim is allowable over both references. Accordingly, withdrawal of the rejection under § 102(b) of claims 1 and 4 over *Anderson*, and claims 1 and 6 over *Chwastiak* is respectfully requested.

C. The Rejection of Claims 1–4 and 6–12 under § 103(a) is Addressed

Claims 1–4, 7 and 12 were rejected under 35 U.S.C. § 103(a) over *Andersen* in view of *Waggoner*, and claims 1–4 and 6–12 were rejected under § 103(a) over *Chwastiak* in view of *Waggoner* and further in view of *Andersen*. These rejections are believed to be moot in light of the amendment.

As noted above, claim 1, as amended, has the ceramic slurry including "about 0.01% to about 15 wt% starch". None of the references, either alone or in combination, describe or suggest using starch as a binder in a ceramic slurry. Thus, claim 1, and claims 2–12 which depended from and include all the elements of claim 1, are allowable over *Andersen* in view of *Waggoner*, and *Chwastiak* in view of *Waggoner* and *Andersen*. Accordingly, withdrawal of the rejection under § 103(a) of claims 1–4, 7 and 12 over *Andersen* in view of *Waggoner*, and claims 1–3 and 6–12 over *Chwastiak* in view of *Waggoner* and further in view of *Andersen*, is respectfully requested.

D. The Rejection of Claims under § 103(a) over *Chwastiak*, *Waggoner* and *Benker* is Addressed

Claims 4 and 5 were rejected under 35 U.S.C. § 103(a) over *Chwastiak* in view of *Waggoner*, and further in view of *Benker*. This rejection is respectfully traversed.

The amendment to claim 1 includes the recitation of "about 0.01 wt% to about 15 wt% starch" in a ceramic slurry, and also adds that "about 10 wt% to about 30 wt%" of a liquid is present in the slurry. None of the three references suggest a combination of starch and a liquid in the wt% ranges recited in claim 1..

A surprising finding in the present invention is that a relatively small amount of a gelation agent (*e.g.*, starch) in the ceramic slurry imparted higher than expected green strength to a formed body (*e.g.*, the green body), such that the body maintained structural integrity throughout the molding and removal process. The high green strength prevented the slurry from disintegrating during the casting process, while also maintaining a constant composition throughout the body. (See the specification, page 8, paragraph [28]). The elements of claim 1 reflect this discovery in the relative amounts of starch and liquid used in the ceramic slurry: The most concentrated mixture of starch and liquid (when the starch is up at 15 wt% and the liquid is down at 10 wt%) yields a starch to liquid ratio of only 1.5 to 1.

Of the three references cited in the rejection, only *Benker* mentions starch as a binder in a ceramic slurry. However, the starch solutions suggested by *Benker* are more concentrated than the ones used in the present invention: All the examples in *Benker* show concentrated starch solutions where 70 wt% of the solution is the starch and only 30 wt% is water. This yields a starch to water ratio of 2.3 to 1, well above the 1.5 to 1 ratio for the most concentrated starch solution in claim 1. *Benker* only describes highly concentrated starch solutions, and does not suggest that less concentrated solutions can impart higher than expected green strength to a green body.

The examples in *Benker* describe slurries containing between 9 and 10 wt% of the aqueous starch solution. (See *Benker*, examples 1–3). Since these solutions are 70 wt% starch and only 30 wt% water, they only provide between 2.7 to 3 wt% water for the slurry, which is well below the "about 10 wt% to about 30 wt%" range for the liquid recited in claim 1. Accordingly, the combination of *Chwastiak* in view of *Waggoner*, and further in view of *Benker*

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PATENT

neither describes nor suggests all the limitations of amended claim 1. Claims 4 and 5, which depend from claim 1, are allowable over the references for at least the same reasons as claim 1. Accordingly, withdrawal of the rejection of claims 4 and 5 under § 103(a) over *Chwastiak* in view of *Waggoner*, and further in view of *Benker* is respectfully requested.

CONCLUSION

In view of the foregoing, all claims now pending in this Application are believed to be in condition for allowance. The issuance of a formal Notice of Allowance at an early date is respectfully requested.

If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at 303-571-4000.

Respectfully submitted,



Eugene J. Bernard
Reg. No. 42,320

TOWNSEND and TOWNSEND and CREW LLP
Two Embarcadero Center, Eighth Floor
San Francisco, California 94111-3834
Tel: 303-571-4000
Fax: 415-576-0300
GB:gb
60167368 v1